The experimental methodology and the results presented are described in the work by Payri et al.
"Experimental characterization of diesel ignition and lift-off length using a single-hole injector", Applied Thermal Engineering , vol. 58, 1-2, pp. 554 – 563, 2013

All the tests in high temperature conditions have been performed in the High-pressure and high temperature facility at CMT. See http://www.cmt.upv.es/F04.aspx

The temperature uncertainty are estimated from the spatial non-homogeneities
The standard deviation is obtained using the temperature measurement recorded during each test by a 0.5 mm diameter thermocouple over a 30 sec interval. The temperature spatial distribution for spray A condition is reported in the CMT web page. See http://www.cmt.upv.es/ECN07.aspx

The definition applied for the measurement uncertainties is $u = \pm\left(2\sigma / \sqrt{N_{test} - 1} + \varepsilon \right)$ where ε represents the known bias error for each experiment. This parameter is specified for each experiment.

LOL measurements – (OH* chemiluminescence)
The definition of LOL bases on the method described by Siebers and Higgins SAE 2001-01-0530
Camera: Andor Istar ICCD Camera.
Filter: 310 cwl +-5 nm
Lens: 100mm UV lens
Gating time window: from 2.0 ms to 5 ms ASOI.
Repetitions: 15 Injections
Pixmm: 5.85
Tip position(pixel coordinates) : [65; 95]

Injection duration: 4.0 ms energizing time - injection duration is 5.3 ms. A second order variation around this value depends on injection pressure and backpressure.
In the uncertainty value reported is included the effect ε that +/- 10% error in the reference peak used to calculate the threshold value have on the results.
Note: the sample picture provided is just one of the fifteen images obtained for each test condition.

Ignition Delay measurements – (broadband chemiluminescence)
The definition of ignition delay bases on the work by Lillo, SAE 2012-01-1239
Camera: Phantom V.12
Filter: short-pass filter (<600 nm)
Lens: 100 mm - f/1.8 – (non U.V.)
Shutter time: 0.047 ms
Frame rate: 20.000 fps
Repetitions: 8 Injections
Pixmm: 7.25
Injection Duration: same as for LOL
The uncertainty includes the uncertainty ε due to the relatively long shutter time (50 µs)

Schlieren movies
Spray vapor phase movies in reacting conditions have been obtained using a schlieren setup. (Settles 2001). The details of the setup are reported below:

Camera: Photron SA-5
Lens: 50 mm – f/1.8
Spatial filtering: a diaphragm with an aperture size d = 4mm was placed in the cut-off plane
Filter: short-pass filter (<600 nm) placed in front of the diaphragm to reject soot luminosity.
Shutter time: 0.004 ms
Frame rate: 50 kfps.
Pixmm: 5.26
Injection duration: 4.0 ms energizing time - injection duration about 5.3 ms
Light source: continuous Xe-arc
The parallel beam was formed using a parabolic mirror (focal length -750mm) and collected with a spherical lens (focal length 450 mm).

Note: the LOL was measured simultaneously to the Ignition delay tests, while schlieren movies were acquired in a different test session. However, the same test rig was employed.

Rate of injection

The rate of injeciton related to these tests can be obtained using the ROI generator available in the CMT webpage (http://www.cmt.upv.es/ECN03.aspx). This application provides an "educated" ROI starting from experimental measurements and it includes fluctuations that are expected to be real, such as those due to pressure fluctuations, while rejects fluctuations that are considered to be experimental noise artifacts.
The discharge coefficient and the orifice diameter needed to obtain the educated rate of injection for each test condition is reported in the table. The coefficients have been obtained extending the work presented in the hydraulic characterization presented in the work by Kastengren et al. "Engine combustion network (ECN): measurements of nozzle geometry and hydraulic behavior", Atomization and Sprays, vol. 22, pp. 1011-1052, 2012.